

Applicant: D. Stoianovici, et al.
U.S.S.N.: 09/943,751
RESPONSE TO OFFICE ACTION
Page 3 of 34

Amendments to Specification

Pages 10-11, rewrite the paragraphs between line 9, page 10 and line 8, page 11, to read as follows:

The needle 50 is any of a number of penetrating members known to those skilled in the art, and more particularly includes any of a number of percutaneous needles known to those skilled in the art. As more specifically described hereinafter each needle 50 also is configured so as to include a gear member ~~164~~ 184 (see Figs. 2-3) that is attached to the exterior of the needle using any of a number of techniques known to those skilled in the art at a predetermined axial location. In use, a stylet also may be inserted into the lumen of the needle 50, so as to provide axial support and so as to provide an end detail more appropriate for minimizing trauma at entry points and minimizing the forces required for penetrating the tissue boundary at the entry point, for example a diamond end detail.

The penetrating member driver 100 includes a housing 110, first and second arms 120, 140, a motorized translation transmission assembly 160, a motorized rotation transmission assembly ~~170~~ 180 and a latch assembly ~~180~~ 190. The housing 110 is configured and arranged so as to provide structural support to the first and second arms 120, 140, the motorized translation transmission assembly 160 and the latch assembly ~~180~~ 190. In the illustrated embodiment, the housing also substantially encloses the motorized translation transmission assembly 160, motorized rotation transmission assembly ~~170~~ 180 and latch assembly ~~180~~ 190. The configuration, thickness, and materials of the housing 110 are selected such that it can provide the required structural support while minimizing its capability for being a source of contaminants

Applicant: D. Stoianovici, et al.
U.S.S.N.: 09/943,751
RESPONSE TO OFFICE ACTION
Page 4 of 34

Q₁ to the medical procedure penetrating member driver 100 is being used in conjunction with. In an illustrative embodiment, the housing 110 is made from aluminum.

Pages 18-19, rewrite the paragraphs between line 15, page 18 and line 4, page 19, to read as follows:

The motorized rotational transmission assembly 180 includes a motor 182, the gear member 184, a drive gear 186, a gearhead 188 and a drive belt ~~190~~ 189. The motor 182 is any of a number of types of fractional horsepower, bi-directional drive motors known in the art including electrical motors, pneumatically powered motors and hydraulically powered motors. In an exemplary illustrative embodiment, the motor is a bi-directional electrical motor. This motor 182 need not be of the encoded type.

Q₂ The gearhead 188 is coupled to the motor 182 and to the drive belt ~~190~~ 189. The drive belt ~~189~~ ~~190~~ in turn is coupled to the drive gear 186 so that the operation of the motor causes the rotation of the drive gear. As indicated above, when assembled, the drive gear 186 is in mechanical engagement with the gear member 184 that is affixed to the penetrating member/ needle 50. Consequently the penetrating member/ needle 50 rotates in a direction 104 in a clockwise or counterclockwise direction responsive to the direction of rotation of the motor 182.

Applicant: D. Stoianovici, et al.
U.S.S.N.: 09/943,751
RESPONSE TO OFFICE ACTION
Page 5 of 34

Pages 19-20, rewrite the paragraphs between line 20, page 19 and line 9, page 20, to read as follows:

13 This drive gear ~~185-186~~ to gear member 184 arrangement yields a gear transmission for the penetrating member/ needle 50 having little preload force and which provides bi-directional rotational motion and zero slippage and backlash. The drive gear 186, the gear member 184 and the drive belt are constructed of a material appropriate for the intended structural loadings and also lucent to the imaging source as also discussed above for the first and second arm cantilevered parts 124,144.

In an exemplary embodiment, the gearhead 188 is a planetary gearhead which is compact in size and allows overall gear reduction to be achieved at the motor location. The drive belt ~~189~~ ~~190~~ is any of a number of belts known to those skilled in the art and in an exemplary embodiment is an o-ring pulley belt. However, other types and configurations of drive belts, such as toothed drive belts are contemplated for use in the present invention otherwise consistent with the teachings of the present invention.